

**IN THE CLAIMS**

1. (canceled)
2. (currently amended) A noise canceling method comprising the steps of:  
periodically inserting a zero-point into a transmission signal ~~on a transmission side~~,  
establishing synchronization based on a received signal,  
extracting the zero-point based on the established synchronization and interpolating a  
noise component of the received signal by using the zero-point, and  
subtracting the noise component from the received signal.
3. (previously presented) The noise canceling method as claimed in claim 2, wherein  
one or more zero-points are inserted at intervals of an integer number of samples.
4. (previously presented) The noise canceling method as claimed in claim 3, wherein an  
inserted number of the zero-points is determined by deciding a signal quality on the reception  
side to be notified to the transmission side.
5. (currently amended) The noise canceling method as claimed in any one of claims 2 to  
4 wherein a transmission line of the received signal includes a transparent transmission line.
6. (previously presented) The noise canceling method as claimed in claim 5, wherein the  
transparent transmission line includes a Nyquist transmission line.

**7. (currently amended)** The noise canceling method as claimed in claim 2 wherein the step of interpolating includes steps of performing a frequency shift of the received signal to a desired frequency bandwidth, decimating according to the zero-point, performing an interpolation, and finally performing the frequency shift in a reverse direction so as to adjust to the original signal, thereby generating the noise component of the received signal.

**8. (previously presented)** The noise canceling method as claimed in claim 7, wherein for the step of interpolating, the zero-point is inserted into the decimated signal, and a low-pass filter process for making an interpolation bandwidth a transmission bandwidth is further performed.

**9. (previously presented)** The noise canceling method as claimed in claim 8, wherein the low-pass filter process includes a cos-squared filter process for making the interpolation bandwidth a Nyquist bandwidth.

**10. (previously presented)** The noise canceling method as claimed in claim 8, wherein the low-pass filter process includes a cos filter process for making the interpolation bandwidth a Nyquist bandwidth.

**11. (previously presented)** The noise canceling method as claimed in claim 7, wherein a frequency bandwidth, in which a noise frequency component is large, is detected in the received signal so that the amount of the frequency shift is automatically determined for the desired frequency bandwidth.

**12. (currently amended)** The noise canceling method as claimed in any one of claims 2 to 4 wherein an automatic equalizing process is further performed so as to remove an intersymbol interference at a former or latter stage of a noise ~~cancellation~~ cancellation.

**13. (canceled)**

**14. (currently amended)** A noise canceling apparatus comprising:  
means periodically inserting a zero-point into a transmission signal ~~on a transmission~~  
~~side~~,  
means establishing synchronization based on a received signal,  
means extracting the zero-point based on the established synchronization and  
interpolating a noise component of the received signal by using the zero-point, and  
means ~~for~~ subtracting the noise component from the received signal.

**15. (previously presented)** The noise canceling apparatus as claimed in claim 14, wherein one or more zero-points are inserted at intervals of an integer number of samples.

**16. (previously presented)** The noise canceling apparatus as claimed in claim 15, wherein an inserted number of the zero-points is determined by deciding a signal quality on the reception side to be notified to the transmission side.

**17. (previously presented)** The noise canceling apparatus as claimed in any one of claims 14 to 16 wherein a transmission line of the received signal includes a transparent transmission line.

**18. (previously presented)** The noise canceling apparatus as claimed in claim 17, wherein the transparent transmission line includes a Nyquist transmission line.

**19. (previously presented)** The noise canceling apparatus as claimed in claim 14 wherein the means for interpolating include means for performing a frequency shift to the received signal to a desired frequency bandwidth, means for decimating according to the zero-point thereafter, means for further performing an interpolation, and means for performing the frequency shift in a reverse direction so as to adjust to an original signal, thereby generating the noise component of the received signal.

**20. (previously presented)** The noise canceling apparatus as claimed in claim 19, wherein the interpolation means include a circuit for inserting zero-points into the decimated signal, and further include a low-pass filter for making an interpolation bandwidth a transmission bandwidth.

**21. (previously presented)** The noise canceling apparatus as claimed in claim 20, wherein the low-pass filter includes a cos-squared filter for making the interpolation bandwidth a Nyquist bandwidth.

**22. (previously presented)** The noise canceling apparatus as claimed in claim 20, wherein the low-pass filter includes a cos filter for making the interpolation bandwidth a Nyquist bandwidth.

**23. (previously presented)** The noise canceling apparatus as claimed in claim 19, wherein the means for performing the frequency shift include means for detecting a frequency bandwidth, in which a noise frequency component is large, in the received signal so that the amount of the frequency shift is automatically determined for the desired frequency bandwidth.

**24. (previously presented)** The noise canceling apparatus as claimed in any one of claims 14 to 16 wherein an automatic equalizer is further provided for removing an intersymbol interference at a former or latter stage of a noise cancellation.

**25. (previously presented)** The noise canceling apparatus as claimed in claim 19 wherein an automatic equalizer is further provided for removing an intersymbol interference at a former or latter stage of a noise cancellation.

**26. (previously presented)** A noise canceling method comprising the steps of:  
receiving a signal periodically including a zero-point,  
establishing synchronization based on a received signal,  
extracting the zero-point based on the established synchronization,  
interpolating a noise component of the received signal by using the zero-point, and  
subtracting the noise component from the received signal.

**27. (previously presented)** A noise canceling apparatus comprising:

- means receiving a signal periodically including a zero-point,
- means establishing synchronization based on a received signal,
- means extracting the zero-point based on the established synchronization,
- means interpolating a noise component of the received signal by using the zero-point, and
- means subtracting the noise component from the received signal.